

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 7248

CSAH NO. 3

OVER THE

RED LAKE RIVER

DISTRICT 2 - PENNINGTON COUNTY



AUGUST 17, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

AYRES ASSOCIATES & COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 7248, Piers 1 through 3, were found to be in good condition with no defects of structural significance observed. Channel bottom aggradation has occurred at the bridge since the last underwater inspection as the water depth soundings were approximately 1 to 2 feet higher and the footing of Pier 2 was no longer exposed. The amount of debris accumulated at Piers 1 and 2 has decreased since the last inspection.

INSPECTION FINDINGS:

- (A) A scour pocket, 3 feet in radius with a depth of 1 foot, was observed at the upstream nose of Pier 2.
- (B) Light scaling was observed around all columns on all piers from 1 foot above to 3 feet below the waterline with a maximum penetration of 1/4 inch.
- (C) A light accumulation of timber debris consisting of 6 inch diameter or smaller branches was observed at the upstream nose of the upstream column of Pier 1 from the channel bottom up 2 feet.

RECOMMENDATIONS:

- (A) Monitor the accumulations of timber debris at Piers 1 during future inspections.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader

Ayres Associates, Inc.



Brian K. Schroeder
Registered Professional Engineer
State of Minnesota

Respectfully submitted,

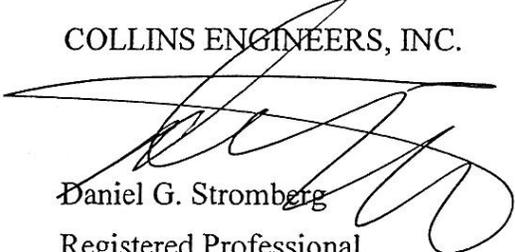
PROFESSIONAL ENGINEER

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/14 License # 21491

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 7248

Feature Crossed: The Red Lake River

Feature Carried: CSAH No. 3

Location: District 2 - Pennington County

Bridge Description: The superstructure consists of four spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The piers are numbered 1 to 3 starting from the west. No design drawings were available to determine foundation type.

2. INSPECTION DATA

Professional Engineer Diver: Brian K. Schroeder, P.E.

Dive Team: Jason A. Cook, James A. Hitchman

Date: August 17, 2012

Weather Conditions: Sunny, 55° F

Underwater Visibility: 4.0 Feet

Waterway Velocity: 1.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3

General Shape: The piers each consist of two hexagonal reinforced concrete columns supporting a rectangular reinforced concrete pier cap. The columns are founded on rectangular footings, but it is unknown if the footings are spread type or pile supported.

Maximum Water Depth at Substructure Inspected: Approximately 4.4 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the downstream end of Pier 2.

Water Surface: The waterline was approximately 13.9 feet below reference.
Assumed Waterline Elevation = 86.1.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/08/12

Item 113: Scour Critical Bridges: Code I/94

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

 Yes X No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
205	Reinforced Concrete Column	6	EA	6				
985	Slopes and Slope Protection	1	EA	1				



Photograph 1. Overall View of the Structure, Looking North.



Photograph 2. View of Pier 1, Looking Northwest.



Photograph 3. View of Pier 2, Looking Northeast.



Photograph 4. View of Pier 3, Looking Northeast.



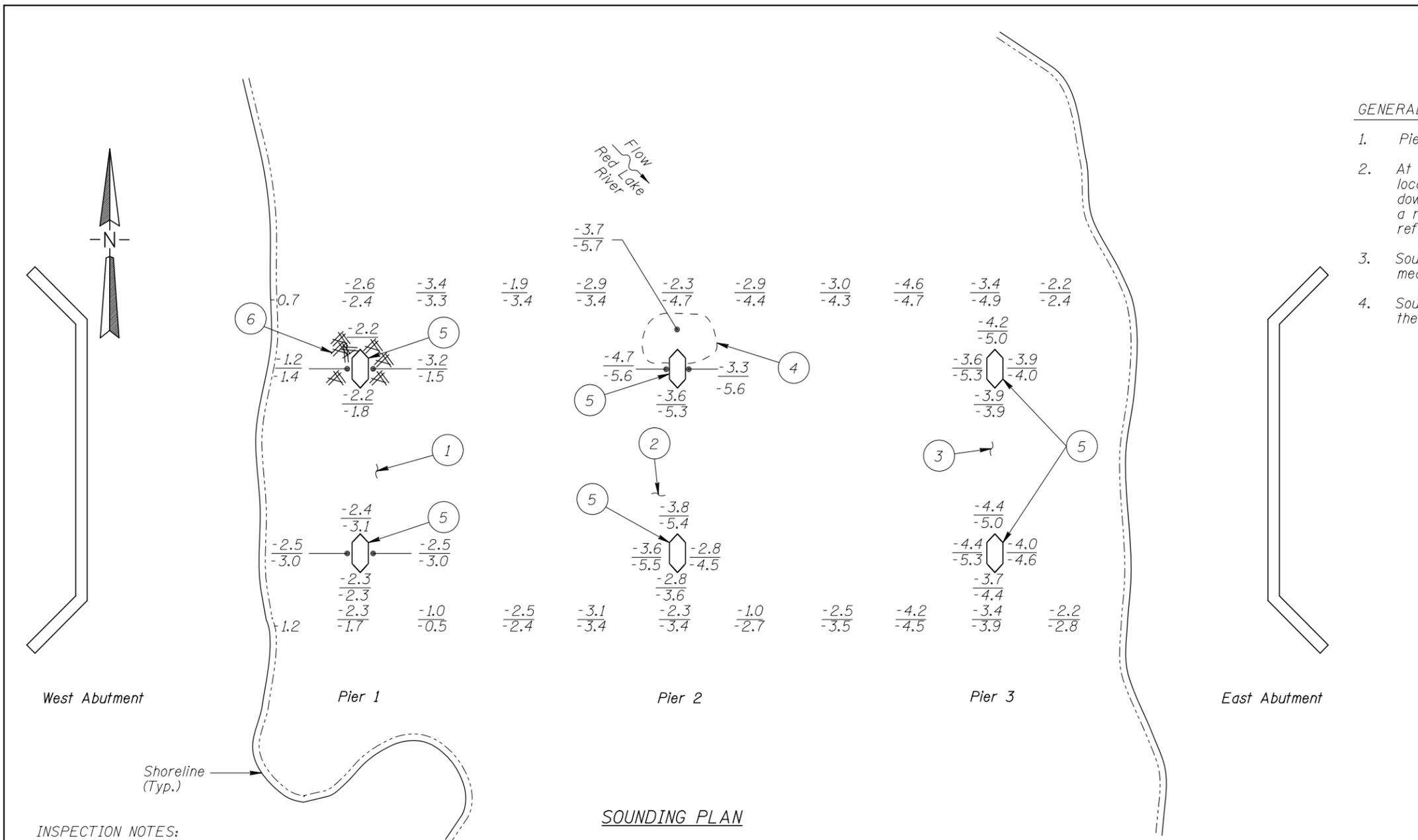
Photograph 5. View of Timber Debris at Pier 1, Looking East.



Photograph 6. View of West Abutment, Looking West.



Photograph 7. View of East Abutment, Looking East.



- GENERAL NOTES:**
- Piers 1, 2, and 3 were inspected underwater.
 - At the time of inspection on August 17, 2012, the waterline was located approximately 13.9 feet below the top of the pier cap on the downstream end of Pier 2. Design plans were not available, therefore a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 86.1.
 - Soundings indicate the water depth at the time of inspection and are measured in feet.
 - Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- The channel bottom material consisted of soft, silty infill with up to 2 feet of probe rod penetration around Pier 1.
- The channel bottom material at Pier 2 consisted of fine sand and random cobbles of up to 1 foot in diameter with up to 1 foot of probe rod penetration.
- The channel bottom material consisted of fairly firm sandy gravel with 3 to 6 inch diameter cobbles and a probe rod penetration of up to 6 inches around Pier 3.
- A scour pocket, 3 feet in radius with a depth of 1 foot, was observed at the upstream nose of Pier 2.
- Light scaling was observed around all columns from 1 foot above to 3 feet below the waterline with 1/4 inch of maximum penetration.
- A light accumulation of timber debris consisting of 6 inch diameter or smaller branches was observed at upstream nose of the upstream column of Pier 1 from channel bottom up 2 feet.

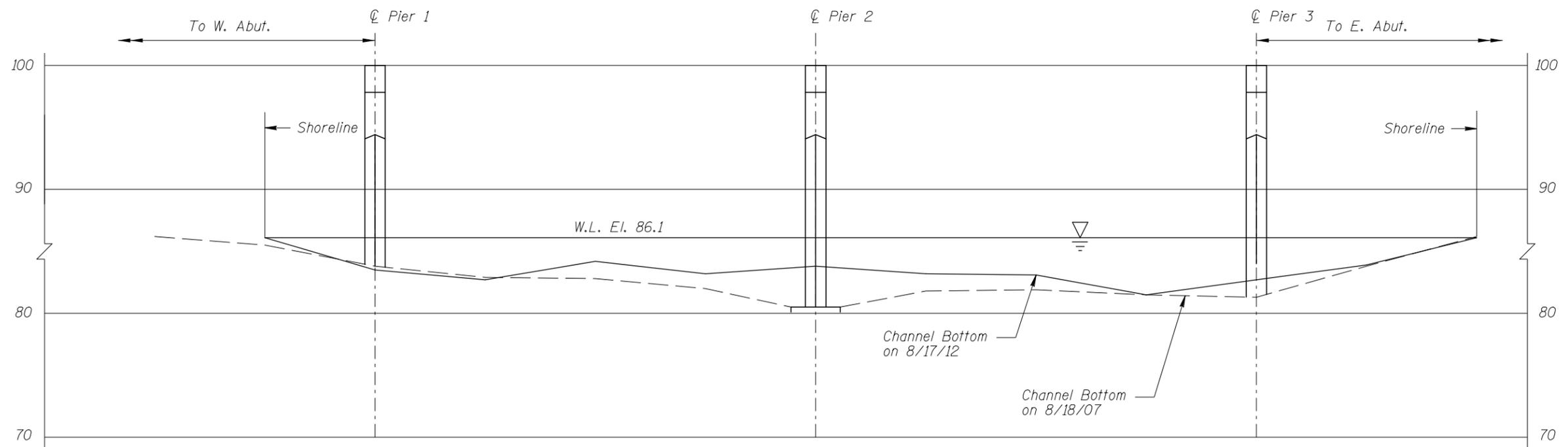
TYPICAL END VIEW OF PIERS
 Presence or absence of piles could not be determined.

- Legend**
- 3.6 Sounding Depth (8/17/12)
 - 3.2 Sounding Depth (8/18/07)
 - Timber Debris
 - Scour Depression

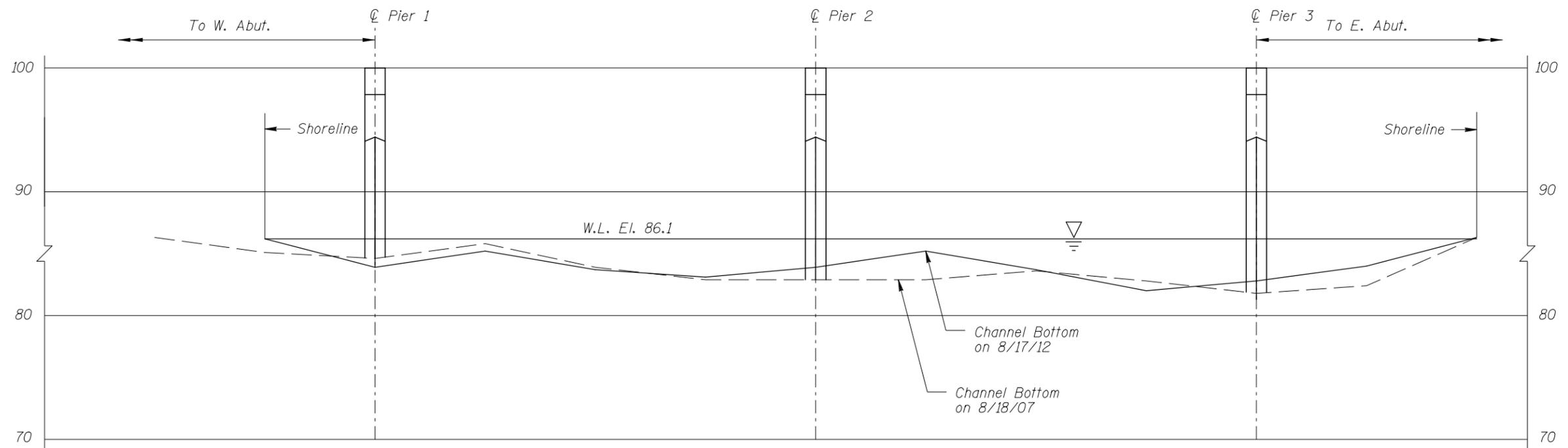
Note:
 All soundings based on 2012 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 7248 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: JAC		Date: AUGUST, 2012
Checked By: BKS		Scale: NTS
Code: 52210161		Figure No.: I

COLLINS ENGINEERS
 123 North Wacker Drive
 Suite 300
 Chicago, IL 60606
 (312) 704-9300
 www.collinsengr.com



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION					
STRUCTURE NO. 7248 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY					
UPSTREAM AND DOWNSTREAM FASCIA PROFILES					
COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	<table border="1"> <tr> <td>Drawn By: JAC</td> <td rowspan="3" style="text-align: center;">AVRES ASSOCIATES 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com</td> </tr> <tr> <td>Checked By: BKS</td> </tr> <tr> <td>Code: 5221061</td> </tr> </table>	Drawn By: JAC	AVRES ASSOCIATES 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	Checked By: BKS	Code: 5221061
Drawn By: JAC	AVRES ASSOCIATES 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com				
Checked By: BKS					
Code: 5221061					
Date: AUGUST, 2012 Scale: NTS (U.O.N.) Figure No.: 2					

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Ayres Associates DATE: August 17, 2012

ON-SITE TEAM LEADER: Brian K. Schroeder, P.E.

BRIDGE NO: 7248 WEATHER: Sunny, 55° F

WATERWAY CROSSED: The Red Lake River

DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR
 OTHER Wade

PERSONNEL: Jason A. Cook, James A. Hitchman

EQUIPMENT: U/W Light, Dry Suit, Camera, Hammer, Sounding Rod

TIME IN WATER: 7:30 A.M.

TIME OUT OF WATER: 8:00 A.M.

WATERWAY DATA: VELOCITY 1.0 ft/sec

VISIBILITY 4.0 feet

DEPTH 4.4 feet maximum at Pier 3

ELEMENTS INSPECTED: Piers 1, 2 and 3

REMARKS: Overall, the piers were found to be in good condition with no defects of structural significance observed. Light scaling was observed on all columns from 1 foot above to 3 feet below the waterline with 1/4 inch of maximum penetration. A light accumulation of 6 inch diameter and smaller timber debris was observed at the upstream column of Pier 1 from the channel bottom up 2 feet. The channel bottom material consisted of soft, silty infill with up to 2 feet of probe rod penetration around Pier 1. The channel bottom around Piers 2 and 3 consisted of sand and gravel with 6 inches to 1 foot of probe rod penetration.

FURTHER ACTION NEEDED: _____ YES NO

Monitor the accumulations of timber debris at Piers 1 during future underwater inspections.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 7248
 INSPECTORS Ayres Associates
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.
 WATERWAY CROSSED The Red Lake River

INSPECTION DATE August 17, 2012

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	2.5'	N	7	N	9	N	7	N	6	6	6	6	7	N	N	N	N	N
	Pier 2	4.7'	N	7	N	9	N	7	7	N	N	N	7	7	N	N	N	N	N
	Pier 3	4.4'	N	7	N	9	N	7	N	7	7	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the piers were found to be in good condition with no defects of structural significance observed. Light scaling was observed on all columns from 1 foot above to 3 feet below the waterline with 1/4 inch of maximum penetration. A light accumulation of 6 inch diameter and smaller timber debris was observed at the upstream column of Pier 1 from the channel bottom up 2 feet. The channel bottom material consisted of soft, silty infill with up to 2 feet of probe rod penetration around Pier 1. The channel bottom around Piers 2 and 3 consisted of sand and gravel with 6 inches to 1 foot of probe rod penetration.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO. USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.